

## Aspects of the Tecumseh Study

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YOUNG investigators must not be led to believe that there are certain strictly confined ways of looking at approaches to experimentation and research. Certainly it seems important to avoid so many scary limitations to starting a study that initiative, ideas, and willingness to proceed are discouraged.

The investigator is asked: Is this approach the most efficient or economical? Is the protocol for continued effort complete? Is there any purpose in beginning if there is population loss? Why collect data that will be worthless in 20 years?

There is not sufficient information and experience in many of the proposed lines of procedure to be sure of best methods. I believe there is ample room for exploration without complete field plans for all future studies.

I doubt if it is worthwhile to make a great effort to achieve mathematical elegance for biological data which are relatively imprecise. Rather we should seek to afford continuity of competent effort, in effect the granting of a license for hunting without fixed boxes.

Tecumseh, Mich., is the scene of a biological community study which has, we believe, some of the basic principles of clinical investigation, of fundamental science, attached to an analysis of health and the growth and development of disorders.

Intuitively—and on experience—I tend to move to the direct approach and direct observation, collecting data of determinable character and noting associations. I wonder if, with some of the restrictions suggested, one would at

present be able to establish the correlation between syphilis and tabes or aneurysm.

The total community satisfies this native impatience. To me, working with people rather than with records as the object of attention is a more profitable basis for observation.

I would first emphasize that the terms “community health study,” “epidemiologic community study,” or “epidemiologic study area” express the idea that we are concerned not only with the human population but with the surrounding conditions under which health is maintained and pathogenic reactions are occurring.

A community in the epidemiologic sense comprises a human population in its biological, social, and physical environment. The population is in fact an integral component of the community's environment, adjusting in it, altering it, or even creating it, and sharing it with other biological populations. In undertaking to study a total community one should, therefore, adopt the view of the naturalist or the ecologist, seeking to detect, observe, and evaluate the influences at play which affect the associated population in this selected but natural universe.

Since disease is a biological phenomenon arising from maladjustment of man with himself or his environment, the basis of susceptibility and the origins of disorder are best determined by intensive study under the natural conditions of occurrence. I am enough influenced by clinical experience to suggest that careful and maintained observations of limited numbers may lead to recognition of significant relationships as readily as extreme numbers and much data obtained too late to apply to the situation. Moreover these observations on pilot experiments may indicate relationships which can then be studied in other or larger populations.

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*Dr. Francis is professor and chairman, department of epidemiology, University of Michigan School of Public Health, Ann Arbor. This text is based on remarks offered at the University of Pittsburgh, November 15, 1960.*

I stress the terms "natural," "naturalist," and "natural history" to emphasize that one is concerned not only with incidents which have occurred but with those to come. By developing measurements of healthful adequacy and tolerance to stresses or insults at play in the community, the role of stresses in inducing abnormality should be more definitely discernible. The social, physical, and biological factors can be viewed together, or, if you wish, inherent (inherited) and external (environmental) factors can be weighed at the same time. Moreover, the control population is provided simultaneously.

It is doubtful that in our present state of scientific competence all reactions, all effects, and all opportunities can be fully exploited. But it is our belief that with direction of research toward standards of health and the origins of disorder, important advances in concept, methodology, and understanding will be made. In effect the result will be to define the epidemosis, the system of affiliated influences and causal relationships which surround and determine the occurrence of a disorder under natural conditions. I presume this can be considered a form of systems analysis, but it is also experimental epidemiology under natural conditions—a phase of human ecology. It should avoid the distortions which come from rigged experiments or manipulative dissembling of a community. The limited sample of individuals or households appears to assemble an artificial, nonfunctional body of independent persons in contrast to the conditions presented when viewing the community itself as an organic unit.

Dr. Thomas R. Dawber has spoken of his current wish that the total population of Framingham, Mass., had been used for the heart disease study there.

Dr. Jacob Yerushalmy has emphasized how fast a representative sample becomes nonrepresentative. Moreover, he has found that some types of populations are not useful for health studies.

Numerous comments have been made regarding the influence of the community and of the way of life upon the population performance.

What can the study of a total community provide which cannot be gained by cross section

through a larger population? The answer depends upon the objective. If one wishes only to follow the course and outcome of definite cases of disease, the advantage of the total population is nothing. It is probable that designated families and suspects selected by sample can be adequately observed for considerable periods of time. Prevalence and incidence rates of certain diseases can be so determined.

On the other hand, while a cross section may obtain a reasonable sample of members of the human population and of some of their characteristics, it may fail to collect its proper proportion of the community's ecology and of the group environment. It is not clear to me how one can have an adequate sample of a community without extensive mapping of its total constitution. The sample may collect an adequate number of specific items but may not be able to relate them coherently with the population as a whole. In a natural community, horizontal, sagittal, or oblique sections may be made so as to reveal entirely different views of the structure. Moving segmental sections or cohorts can be viewed again under natural conditions.

It is extremely important to make clear, however, that we are not dealing with an either/or choice. A variety of procedures is available for undertakings of different scope and intent. The judgment of the competent investigator must certainly be allowed great freedom in selection of his experimental methods. And I would emphasize again that population studies are experiments to disclose or clarify correlations and should be so viewed. This purpose is to determine health-preserving influences and pathogenic influences residing in or at least operating in the community.

The type of study in which we have engaged at Tecumseh must be considered in various phases. The original basic undertaking is truly ecologic in intent, aimed at describing life and death in a community whose population and environmental constitution has been identified and will be kept under continuous surveillance for alterations which increase health or disorder. It may be viewed in its entirety or as a collection of social or biological or even physical reaction flasks.

The study of cardiovascular and related disorders is but one segment of the general objective. It proposes, after extensive history and medical examination, to give concentrated attention to those families and genetic kindreds in which one or the other syndrome is identified to detect and evaluate the genetic and environmental factors contributing to their incitement.

The advantages of studying the total community for these purposes appear to be:

1. The embracement of entire neighborhoods in juxtaposition to one another so that clustering of cases would be more readily discernible.

2. The continuous observation of comparable kindreds under similar environmental exposure is more readily maintained.

3. The detection and measurement of environmental changes and their effect upon health and pathological reactions can be more easily studied, since they can be more readily applied in a community than to items of a sample.

4. A continuous surveillance of the community of this size at least is more adequately maintainable than a geographic sample of a large population.

5. The effect of "community reactions" on health and disease incidence are more likely to be measurable with respect to factors such as unemployment, elections, exposure to new highways, and epidemics.

6. Since a large body of data will be available regarding the community, a variety of relations can be examined or suspected ones can be tested without requiring separate or numerous ad hoc inquiries of each. Moreover, their validity can be readily checked in the same population or known segments thereof. One may thence develop hypotheses in the course of the study. Speaking of economy, one may ask how many ad hoc studies are equivalent in cost to one integrated study, or in their value to etiological analysis.

7. The entire complex of interrelationships between events, exposures, habits, and disorders can be explored. Similarly, the occurrence of different disorders in the same kindreds or groups may give information of common factors in etiology or response. This does not seem to be so readily approachable in a sample.

8. Since the studies require close integration of epidemiologic and clinical procedures with fundamental laboratory research, the location should permit ready movement of research activities back and forth, from the field to the clinic, to the laboratory, or vice versa, so as to develop methods of investigation and to permit their test under field conditions. Community medical facilities can be more effectively employed in the study of a total population than under sampling conditions.

9. I believe the examination of a population can under these circumstances be done less expensively than the study of a similar sample in a large city.

Two other features need consideration. In an experiment such as ours in a total community, much research must be devoted to establishing standards of healthful competence and to detecting early deviations of preclinical nature. Hence, the study should serve as an advance post in guiding this entire direction of medical research toward prevention of the chronic diseases.

The second aspect relates to the role of such a community study in medical education. There has been a strong active support from clinical and other departments of the University of Michigan. Public health and medical students, as well as faculty members, have the opportunity to participate in the studies. The availability of this total community as a teaching facility may give further impetus to the development of interest in ecology and preventive medicine and to the concept of "physician to the community" as well as to the individual.

## Mental Illness

Some three-quarters of a million patients fill our mental hospitals, occupying more than half our hospital beds. A quarter of a million more men, women, and children are admitted every year. All told, mental illness costs this country more than \$1.7 billion each year. It cost over \$850 million in 1959 to run the nation's mental hospitals. . . .

The cost in dollars only introduces the story. In terms of loss of precious human talent, in terms of family misery, in terms of infinite personal tragedy, the cost cannot be measured.

The facts are in. The Joint Commission on Mental Illness and Health, which was authorized by the Congress, took more than 5 years and spent some \$1.5 million to gather them for us. I commend the commission's 10 monographs and its final report, "Action for Mental Health," to you, to the Governors of our States, to members of the Congress and State legislatures, and to all citizens. . . .

These findings startle even persons knowledgeable in the field of mental illness. They show that 80 percent of our 277 State mental hospitals still provide only custodial care for patients; only 20 percent have participated in modern advances designed to make them truly therapeutic. They define the "unfinished business of mental health" in this way: more than half of the patients in most State hospitals receive no active treatment of any kind designed to improve their mental condition. This is so despite the fact that the outlook for the schizophrenic patient, the main tenant of our mental hospitals, can be good under the best treatment conditions. These findings show that many of the patients in State hospitals do not need to be there at all.

Now, what to do? . . . We do not need to start afresh as a Federal Government. The National Institute of Mental Health, in the years from 1950 to 1961, spent a total of \$379 million on the pursuit of new knowledge and the training of much needed personnel.

The Federal Government has also aided in the construction of mental hospitals. Since the start of this program, 131 mental hospitals have been finished or are under construction—at a total cost to the Government of nearly \$50 million. Saint

Elizabeths Hospital and the Veterans Administration—always eager to seek new knowledge and try new ways—have pioneered in mental hospital care.

No, we do not need to start afresh. But we do need a fresh approach. I like the approach the Joint Commission offers to us. . . .

- A hard, creative scrutiny of our present mental hospital system. . . .

- That this hospital system eventually be replaced by a constellation of psychiatric resources in the heart of the community. . . .

- The gradual conversion of State hospitals of more than 1,000 beds into excellent professional treatment centers for all chronic diseases (including psychiatric disorders) and their replacement by community clinics, general hospital psychiatric units, special intensive treatment centers, and such after-care and rehabilitation services as day hospitals, night hospitals, or foster family care. . . .

- The redefining of what treatment is and who may do it—the adoption of a broad liberal philosophy of treatment which would enable many professional and nonprofessional workers without medical training to share the workload. . . .

- The recruitment of sorely needed qualified people into mental health fields.

- An increase in our basic research and more varied and long-term research to predict and prevent various forms of mental illness. . . .

Let us, in and out of Government, reevaluate our thinking about mental illness and how we have dealt with it. Let us ask ourselves—are even the modest advances we have made in recent years on the right track? Or do we need an entirely new point of departure? Are we exploring every possibility and innovation—psychological, social, and biological? Are we properly evaluating each scientific research program? Are we using our hospitals—the places where the patients are—as the logical place for constructive research? Are we as individuals ready to accept and act on the findings provided for us?—*Excerpt from an address by ABRAHAM RIBICOFF, Secretary of Health, Education, and Welfare, before the Mental Health Institute, Saint Elizabeths Hospital, Washington, D.C., May 3, 1961.*